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ABSTRACT

This handbook is intended to help craft lecturers in further education colleges teach students who have difficulties with basic communication skills, including reading, writing, and calculation. It gives suggestions on how craft lecturers can help students improve their literacy and numeracy in the workshop and classroom. Examples based on specific crafts that can be relatively easily adapted and applied to other craft subjects are given. Introductory materials discuss determination of reading, writing, and calculations tasks required in courses and teaching the theory of a craft subject. The next section concerns reading tasks with which craft students are faced, including the blackboard and overhead projectors; reading instructions, handouts, and worksheets; and textbooks. It considers the difficulties these pose and examines ways in which the craft tutor can help students improve their learning of the literacy and numeracy skills of the craft. The following section deals with access skills--library and research skills. Students' writing is the focus of the next section. It suggests ways of dealing with the wide range of written ability. The section on numeracy focuses on needs identification, instructional methods, and areas of numerical work. The final section suggests testing methodology. (YLB)

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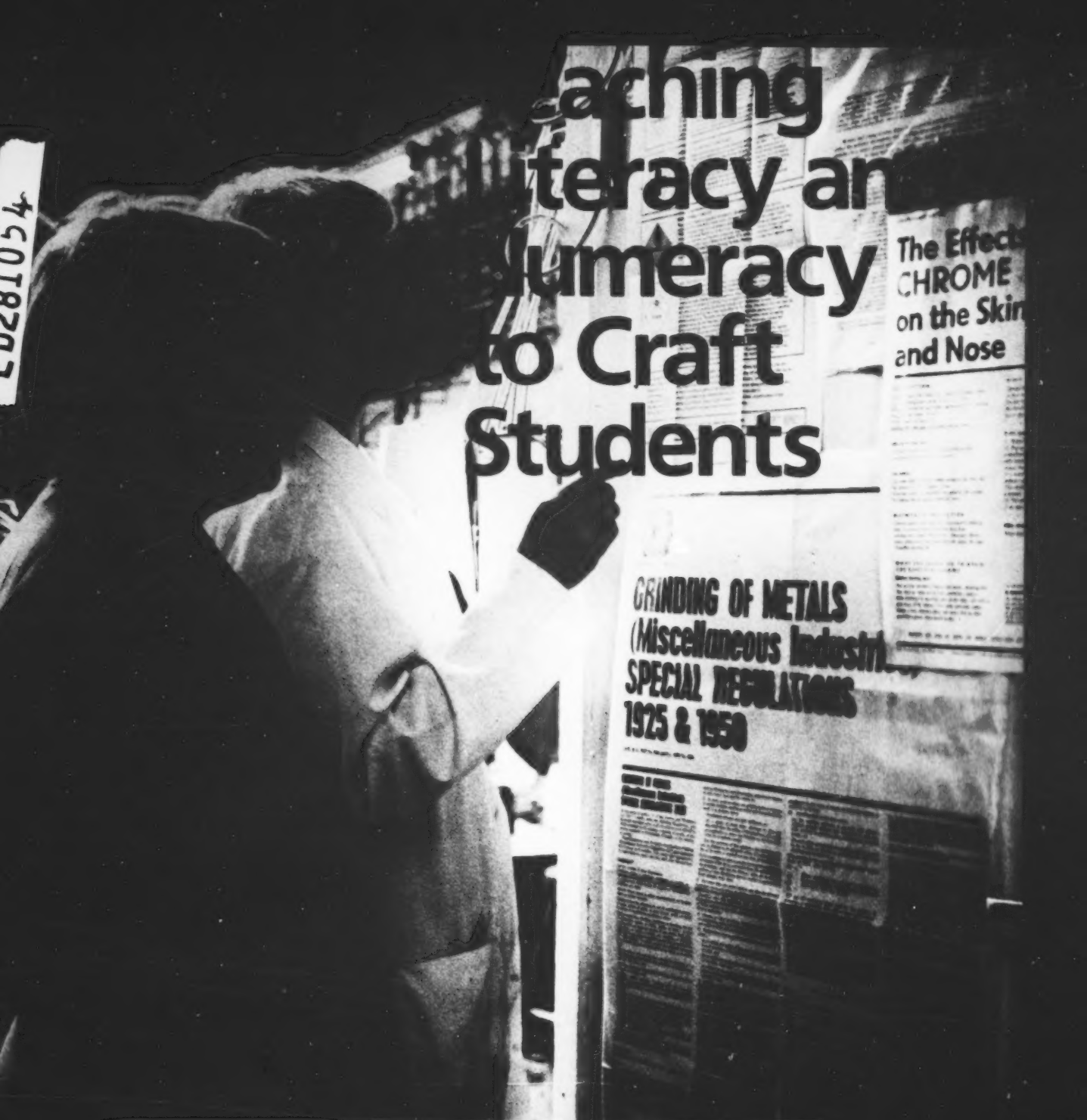
Teaching Literacy and Numeracy to Craft Students



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ALBSU

Foreword

"Teaching Literacy and Numeracy to Craft Students" has been produced to help craft lecturers teach students who may have some difficulties with basic communication skills, including reading, writing and calculation. It takes the view that most students who have some difficulty can be helped as part of the course and benefit more by this type of help than by being withdrawn for part of the course for specialist remedial tuition.

This handbook considers some of the ways craft lecturers can help students as part of a course and suggests examples based on specific crafts which can be relatively easily adapted and applied to other craft subjects. It has been produced by a small group of practitioners with experience of craft and basic communication skills teaching.

Finally, particular thanks are due to two members of ALBSU's staff, Judith Banbury who led and co-ordinated the Working Group and Rosemary Carter who was responsible for its administration.

Alan Wells
Director
Adult Literacy and Basic Skills Unit

Teaching Literacy and Numeracy to Craft Students

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Group Members

Sue Abell	Senior Advisory Tutor, Adults with Learning Difficulties, Essex
Martin Forbes	Lecturer in Applied Sciences, Isle of Ely College, Wisbech, Cambridgeshire
Alicia Katsoulacos	formerly Youth Opportunities Programme/Literacy Tutor, Barnet College
Beryl Sharp	Adult Literacy Tutor/Organiser, Harrow College of Further Education, London Borough of Harrow
Joan Stevenson	Lecturer in Communication and General Studies, South Fields College, Leicester
Ken Sutcliffe	Construction Lecturer, North Hertfordshire College, Letchworth, Herts.

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Kingsbourne House, 229/231 High Holborn,
London WC1V 7DA.

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Introduction

This book is intended for craft lecturers in further education colleges who find that students on their courses have some difficulty with literacy and numeracy. It attempts to look at the literacy and numeracy elements of craft courses and suggest ways of helping students improve the reading, writing and calculation which they need to be able to complete a college course successfully.

Craft lecturers often meet students who are fairly good at learning the practical part of courses but who drop out of courses or fail exams because they can't express their skills on paper, or fully understand worksheets or instruction manuals. This book gives suggestions on how craft lecturers can help students improve their literacy and numeracy both in the workshop and in the classroom.

Craft courses may include a timetabled period which is specifically aimed, among other things, to develop the student's literacy or numeracy called 'Communications' or 'English', 'Maths' or 'Numeracy' and the suggestions in this book are not intended to be a substitute for this session, but to complement it. There are often topics which can be dealt with naturally in a craft workshop and which students may learn more easily because they can immediately see the application of the reading, writing or calculation task.

The extent of the problem

A project carried out in Bolton Technical College between 1975 and 1978[1] looked at the literacy abilities of almost 1,550 students and the reading material craft students came into contact with

- on their course
- in the careers/industrial situation and
- in a social setting

The project also looked at the role of the college and lecturer. The most significant findings were that

- 15-20% of the day release population had serious literacy problems
- most courses attract some students with literacy difficulties
- many classes contain an extremely wide spread of ability.

Overall it was felt that a significant number of students were not able to benefit fully from their courses.

Research into the numeracy abilities of young people and adults suggests a fairly wide range of ability. The Cockcroft report[2] found a "seven year difference" in the mathematical attainment of 11 year olds. A national survey[3] conducted to assess adults' mathematical ability found that many adults find difficulties in coping with the calculations needed in daily life, for example:

- one adult in ten could not cope with simple addition
- three adults in ten could not cope with simple percentages
- four adults in ten could not cope with a simple timetable.

It is likely therefore that there will be a number of young adults in colleges whose mathematical ability will affect their chances of completing a course successfully. It seems likely that the implications of these findings may be equally valid now that a large number of young people are entering colleges on the various courses sponsored by the Manpower Services Commission.

1. "Literacy Skills: Standards and Demands in Further Education": Peter M Stewart. April 1978.
2. "Mathematics Counts" HMSO. Dr W H Cockcroft.
3. "Adults Mathematical Ability and Performance", Advisory Council on Adult and Continuing Education.

Although the pattern of provision for young people on training courses is likely to change in the next ten years, there are a number of common factors. Courses will be either on a full-time, day or block release basis offering work experience, where relevant, and will take place in industry, community based workplaces and colleges of further education. Those young people who have previously left school with few or no qualifications to enter work which affords little or no opportunity for training, and those who are unemployed, are likely to be given the chance to enter such courses and to improve upon those basic skills which they may not have fully mastered at school.

In colleges it is likely that there will be increasing co-operation between craft lecturers and basic education lecturers in order that those students who most need help are given support and the chance to gain full benefit from the course. Additionally the new vocational preparation courses are likely to be concerned with the teaching of transferable rather than job specific skills and will include an important element of literacy, numeracy and basic skills tuition.

The intention of this book is to look at the contribution the craft lecturer can make to the development of students' literacy and numeracy abilities in the context of the course as a whole and looks at the requirements of various craft courses using examples drawn mainly from construction, hairdressing and catering. It is hoped that lecturers from other craft areas will be able to identify common principles and apply them to the courses they are involved in.

Setting the Scene

The following quotations were taken from interviews with a craft lecturer and a craft student. The craft lecturer taught bricklaying and associated construction work and the craft student was on a City and Guilds Catering Course. Their experiences and comments were felt to be fairly typical. Both were asked to think about literacy and numeracy as it relates to acquiring knowledge of a craft.

Craft Lecturer

Many years before working in the college I served an apprenticeship in bricklaying.

At that time we had apprentices, most were quite good. They had a motive — something to work for. It was just a matter of keeping abreast of them — showing them something. You just had to work alongside them. Now I've come into college to teach I have to explain the theory. There aren't always the facilities to go out and do a job you have to explain it in words. Students are not very forthcoming on reading and writing. The first set of written work I gave out - some strange things came back on the answers. They weren't wanting to show their true abilities, they'd give me a piece of work with little funny drawings and instead of their name they'd write 'me'. I was quite taken aback. They say things like 'I don't see what good it's going to do me'. 'I come because I'll get my money stopped'. 'They'll dock us our money!' They're very keen on painting and decorating - but not that many want to do bricklaying - they don't think it's a very good job - out in all weathers. There's a lot of ignorance about the job.

Lecturers always say there's too much paperwork to do. They want to get on with the job. Most lecturers would feel the bigger percentage should be the practical part so that it doesn't involve the student in too much written work. Possibly they don't allow as much time for written work as they should do. The lecturers are inclined to say 'We'll cut all the pieces of wood to length,' instead of saying 'We'll get the students to go to the stores and order.' Time is a factor and the technicians patience.

Making mistakes - yes we all make them. So many people make excuses and they blame it back on the student. Using the blackboard – I had never done any writing of any amount before. I got it together on OHPs and the students said 'You are doing nothing while we're doing all the writing'.

I was talking to one of the pattern-makers. He said 'It's all very well simplifying but you've got to make sure they know the technical words. If they're taking an exam in it they've got to know the meaning of it.'

Numeracy comes more into painting and decorating - working out quantities and so on - all the trades need to know amounts. Basic geometry is important. I've been working out bricks for years - you automatically work out the courses (that's a row of bricks) because you know how many to a metre. If you are doing it and you're starting from scratch with students you need to know the size of each brick and start from there. You go by courses when you're used to doing that you do 5 or 6 courses in your head. And again when I was working 'on the line' (working on the building line) you'd know how many bricks to a course. Say there's 4 courses to a foot - you'd know just like that. The students are dealing with the brick as an individual unit and not as a mass. And as for tables. They don't always know their tables - if I work something out in my head they might say 'Oh that was quick'.

It's important knowing the bonding and the number of bricks in a lift. It's the labourer who is working out how many bricks to a lift, and you might say to a student - 'You want a couple of dozen bricks'. I suppose some would have to count out two lots of twelve.'

Why are some students behind the others with their literacy and numeracy skills? Have they been lazy, badly taught, away from school a lot, or are they just slow at learning?

Nick is in his third year as a day release catering student. From the beginning of the course he has had problems with his theory work. He cannot express himself easily on paper, and his spelling and handwriting are poor. His tutor's assessment is that, though he may be able to pass the multi choice questions in his final exam, this will also include a written paper, with which he will definitely struggle.

Craft Student

I think I have improved a lot at college. I can manage the practical work and that has given me confidence. I can talk to my teachers and they understand my problems and give me extra help. I don't mind doing extra work at home. In fact I enjoy it. Soon after I started at college I decided to try to read a book, but the one I got was too difficult, and I couldn't remember the story as I went on, so I never finished it. So I started reading short stories – horror stories mainly — and I enjoy those, though I'm still quite slow. I try to practise my writing as well, though my spelling's not very good.

There aren't any books around the house, or anything like that. At the moment I've only got a job for the summer months because the café where I work closes down for the winter. I want to better myself. I've been at college two years and that's given me a wider outlook on life. I came with no qualifications, yet after one year I got a pass in my catering exams and in my City and Guilds Communications. So now I feel I've done something I want to go on from there.

Course Requirements

At first glance a syllabus may not appear to require a great deal of reading, writing or calculation. The following are extracts from the City and Guilds 705 Catering Course.

Health and Safety	Safety in the use of catering equipment and materials. Knowledge of the laws covering hygiene. . .
Identification of Tools and Materials	Knowledge of the uses and care of kitchen equipment. . .
Analysis Selection and Suitability	Identify the changes in structure and texture of foods exposed to poaching, stewing and braising. . .
Description of Function	In the presentation of meat offal and vegetables describe braising as a method of cooking and apply the braising process to appropriate foods. . .
Properties of Materials and Tools	
Trade Terms Technical Terms	Understand and use both in verbal and written forms terms such as 'farinaceous', 'salamander', 'hors d'oeuvres', 'profiteroles', 'a la carte', 'haute cuisine', 'crudités'. . .
Stores and Storage	Describe the use of fresh and convenience products with reference to correct storage. . .

Although the syllabus may primarily require craft knowledge and experience the student will still need to show that he or she has successfully understood the course and will need to retrieve information from books, handouts and trade journals.

Even if students are fairly knowledgeable about the preparation of, for example, an *hors d'oeuvre* they will still need to read information about it and make notes. If the literacy and numeracy elements of a caterer's work are added to the requirements of the college, this could include the following:-

In college

Literacy for coursework

- Take notes
- Read handouts
- Read from an OHP/blackboard
- Read from textbooks
- Taking exams
  - —read the questions
  - —write the answer
  - —or complete a multiple choice question
- Read and write for homework
- Use directories, reference books, skimming and scanning

Numeracy for Coursework

- Recipes — calculate percentages and proportions
- Use metric conversion tables
- Estimate and plan time
- Recognise temperature values
- Calculate costs of food
- Order food

At work or in the college restaurant

Literacy

- Book in customers
- Read product instructions
- Read equipment instructions
- Read safety notices/instructions
- Order stock
- Check stock
- Read and write menus
- Read and write bills
- Use appropriate foreign terms

Numeracy

- Calculate times
- Use percentage/proportions for food preparation
- Order stock
- Check stock
- Calculate discounts
- Compare prices
- Calculate VAT

The literacy and numeracy requirements of other craft areas may be equally demanding. It is sometimes assumed that construction is an area in which practical ability is the major requirement. However, here are some of the reading, writing and calculating tasks required of a student doing a painting and decorating job in the workshop

- calculate area covered by paint
- calculate area covered by wallpaper

} use of multiplication, division, square roots

- calculate quantities of paint, wallpaper and paste (estimation of volume and area)
- read instructions on paste packets, paint tins
- read safety instructions on using paintstrippers etc.

Although knowledge, experience and practical skills vary from craft to craft, the literacy and numeracy requirements are often similar. Students' ability to cope with course requirements will also vary. Some will have trouble in spelling and hence may find it hard to learn technical words such as 'architrave' or 'bechamel'. Others who find it hard to express themselves in sentences may be floundering if asked to describe, in written form, the properties of a material, or the correct use of a tool. For example, a hairdressing student may be asked to describe the theory behind a specified technique in permanent waving, or a carpentry student the use of a plumb bob. For some students numeracy will present the major problem. Students unable to calculate proportions may well waste expensive chemicals in a hairdressing salon or building materials on site.

The questionnaire on page 9 is intended to help craft lecturers identify some of the reading, writing and calculation tasks involved in their courses.

Does the course involve the use of:

- ☐ textbooks
- ☐ manuals
- ☐ handouts
- ☐ worksheets
- ☐ test papers
- ☐ reading from the blackboard or OHP?

Do students have to cope with written instructions,
e.g. commercially produced leaflets, packages of materials?

Do students have to:

- ☐ make notes
- ☐ write essays
- ☐ answer questions in writing
- ☐ fill in a job or time sheet?

Do students need to:

- ☐ 'look it up'
- ☐ refer to their notes
- ☐ pick out a word from a list
- ☐ check whether a product is suitable
- ☐ read catalogues
- ☐ order equipment or stores?

Does the craft subject involve any

- ☐ measurement
- ☐ estimation
- ☐ calculation of weight
- ☐ calculation of time
- ☐ calculation of length
- ☐ calculation of proportion?

Is the subject ever tested using written questions or answers?

This handbook looks at some of the difficulties students on craft courses may encounter, and suggests a number of ways in which the craft lecturer can improve the presentation of handouts, worksheets and other written material.

Teaching the Theory of a Craft Subject

In craft subjects a great deal of the teaching is likely to take place during demonstrations and in practical work, when those with literacy and numeracy problems are at less of a disadvantage because they can see and hear what is happening. Theory work has to be faced, though, if students are to have a solid grasp of the principles of their subject, and if they are eventually going to be able to convince the examiner that they should pass their course. The problem for the lecturer is to think up ways of 'predigesting' material or imparting it in such a way that even those who are weak at reading, writing, or comprehension can still learn the basics of their craft.

Let us take as an example a catering lecturer who needs to teach a number of sauces which the students are supposed to know about. There are various ways she could go about this.

1. She could tell the students to read about it in the chapter in "Practical Catering". In fact, almost nobody could remember anything as complicated as sauces just by reading about them, so she would have to ask for some written work. She could ask the students to write an essay but a proportion of them are likely to just copy great chunks word for word out of the text book. Then they are likely to get upset at the suggestion that there is something unethical, or at least lazy, about this, saying that there is no other way they could do it.

2. The lecturer could read out her own notes at dictation speed, while the students scribble them down. A poor writer though is at a double disadvantage. Not only may she not be able to read her own writing afterwards, but, if she is slow at getting the words down on paper, she may miss bits out, making nonsense of the passage concerned. It is unlikely her notes could ever be used for revision.

3. The lecturer can take her job title literally and deliver a lecture, leaving the students to make what notes they can. But note-taking is quite a sophisticated process. It requires the ability simultaneously to listen to what is being said now, while sorting out in the mind what has just been explained, and choosing the salient points to put on paper. If it takes all the student's concentration to write any words at all, the result is not likely to make much sense, but will consist of random disjointed phrases which happen to lodge in the memory.

4. The lecturer can make it easier by writing her key points on the board or overhead projector. The student then at least has something to copy, and the lecturer can enlarge on the points verbally, with the chance to move away from the language of the textbooks to everyday language. "All the sauces in this list are derivatives of Sauce Hollandaise. That means that if you think of Sauce Hollandaise as the tree, all of the other sauces are the branches."

5. The lecturer can produce her own hand-outs containing the most important information.

   She might think it helps to supply background information, such as a map of Europe to help those with poor geography to locate the origins of sauces such as Allemande, Espagnole and Italienne.

   Handouts on their own are of limited value as most people find that to learn something they have to work through it. A worksheet helps to ensure that the points are understood - or at least to enable the lecturer to see what has not been understood.

6. There are various kinds of worksheets that can be devised. Some have key words omitted, for the students to fill in:

   - "A rich brown sauce is called Sauce . . . . . " (ESPAGNOLE)

   - "The flour/fat mixture used as a thickener in sauces is called a . . . . " (ROUX)

   In these examples the number of dots represents the number of letters in the missing words. Another type of worksheet is the 'gross multi-choice' paper, where all the missing words are listed

together, and a choice has to be made among them. To make it more difficult, extra words can be listed, which are not required or the same word used more than once.

It is possible that students learn more from writing an answer than from answering multi-choice questions, because putting things down in your own words impresses them on your memory. But for those who find writing a mammoth ordeal, not only does a great deal of it spoil the satisfaction of learning a trade or craft but it is quite probable that the resulting essay might end up either incomprehensible or failing to say what its writer intended. Unfortunately work on the craft syllabus can't usually wait while literacy problems are sorted out; efforts have to be made on both fronts simultaneously. Careful consideration of the method used to teach the subject can ensure that learning is most effective.

Reading Material in Craft Teaching

This section looks at the reading tasks that craft students are faced with, including the blackboard and overhead projectors (OHP); reading instructions; handouts and worksheets, and text books. It will consider the difficulties that these sometimes pose, and examine ways in which the craft tutor can help students to improve their learning of the literacy and numeracy skills of the craft.

Using the Blackboard or Overhead Projector

New Words

You probably use the blackboard or OHP when you introduce a new word e.g. 'gypsum', and this is very useful for students with reading or spelling difficulties but by the end of the lesson blackboards have often become an impenetrable jungle. To give maximum assistance to those who have problems, it is important to organise the text:

- the word will have more impact if it has already been introduced verbally and explained or demonstrated where necessary
- the association between the spoken word, its meaning and its written form will be built up more effectively if the word is repeated as it is written up
- such association is further developed if the student is encouraged to say the word. This can be achieved by asking a question to which the word is an appropriate response (e.g. 'What is usually used for setting plaster?')
- a further important stage is to get the student to write the word. This can be incorporated with note writing and/or testing by giving a written text with gaps (e.g. 'the usual setting agent for plaster is . . . . . ')
- where it's known in advance that a number of words are going to be introduced, it will help to plan in advance where on the blackboard or OHP they might be placed so that connected words can be close together and larger bodies of text can be kept separate.
- the chalk shows up much better on a clean blackboard. Students with reading difficulties will find it easier to cope with clear distinct chalk markings
- it is also more likely that the lecturer's spelling will deteriorate when using a blackboard. It is worth being aware of this, and checking from time to time by standing back well away from the board.

Notes

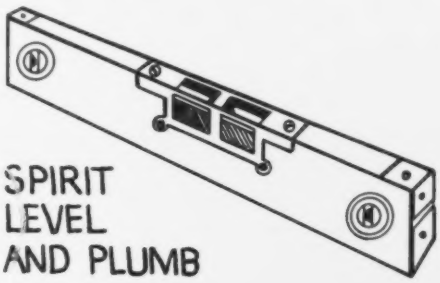
You may use the blackboard or OHP when you want the student to put notes in his book.

This OHP transparency opposite, for example, can be used showing tools individually. Students can then be asked to write down the names as a simple test of recall. Names can then be revealed so that students can check their own spelling. They can then be asked to specify the use of the tools which can then be revealed as a check. They would then be given an incomplete version of the same information and asked to complete it in class and at home. Their notes are likely to be much more effective than if the information had been presented verbally.

TOOLS AND THEIR USES

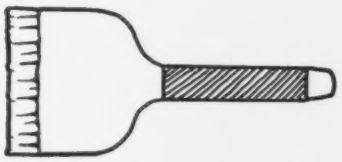
BRICK TROWEL

Used for laying the bed joints for bricks.



SPIRIT LEVEL AND PLUMB

Used for plumbing the angles vertically and levelling the courses horizontally.



BRICK BOLSTER

Used in conjunction with a club hammer for cutting bricks.

Calculations

Calculations will often be explained using the blackboard. For the benefit of those students with numeracy problems it is worth remembering some of the obvious pitfalls:

- Assure the students that you will give them time to copy down the working afterwards — in this way you can get them to follow it through with you and thus make sure they understand each stage. All too often the less numerate student struggles to keep up with writing down the numbers but still doesn't know why and how those numbers were arrived at.
- Try to put in each stage of the calculation no matter how simple it may appear to you. Otherwise, when students come to look at the correctly worked examples, they may make little sense to them. So, instead of:

$$\frac{36}{144} = 0.25$$

write: $\frac{36}{144} = \frac{3}{12} = \frac{1}{4} = 0.25$

with any other necessary explanation in between.

- Similarly, avoid what can be the most irritating use of the blackboard duster — namely continually rubbing out bits in each stage to replace it by the next set of numbers. Students do not have the stages to copy down, nor are they able to make such rapid alterations using pen and paper.
- Try and lay out a clear and logical blackboard display. Just as students should be instructed to do 'working out' to one side of the main calculation, in order that obvious errors can be spotted, calculations should be placed on the blackboard so that each stage of the working is obvious.

Reading Instructions

Despite the best efforts of most manufacturers to make their product information as simple and informative as possible product pamphlets are often still a huge barrier to learning.

This is a problem which spreads right across the range of craft areas from seed packets to the assembling of kitchen furniture. Hairdressing lecturers, however, seem to have to cope with the biggest variety of such pamphlets since they usually attempt to familiarise their students with as many manufacturer's products as possible.

In a college salon it is quite common for a lecturer to suggest that students refer to the appropriate leaflet since detailed advice on each process being carried out is not feasible when the lecturer is supervising as many as twelve different processes. The examples which follow show some of the difficulties students may experience.

Many pamphlets carry charts which are used to transmit information about colouring or bleaching of hair. These can be exceptionally difficult to follow since each manufacturer has their own format, terminology and display methods — as well as their own 'trade name' for each colour.

A point system usually throws up problems with students who struggle with decimals — even though this system has nothing to do with any decimal or other mathematical system.

	NATURAL HAIR COLOUR						
COLOUR	DARK BROWN	BROWN	LIGHT BROWN	DARK BLONDE	BLONDE	LIGHT BLONDE	BLEACHED BASE FOR TONING
1	20	20	20				
3	20	20	20	20			
4	20	20	20	20			
5	20	20	20	20	20		
6		20	20	20	20		
7		30	20	20	20	20	
8			30	20	20	20	
9			30	20	20	20	
10				30	20	20	
7.01		30	20	20	20	20	
8.01			30	20	20	20	Yellow
9.01				20	20	20	Pale Yellow
10.01				30	20	20	Very Pale Yellow
6.1		20	20	20	20		
8.1			30	20	20	20	Yellow
9.1				20	20	20	Pale Yellow
9.13				20	20	20	Pale Yellow
10.1				30	20	20	Very Pale Yellow
4.26	20	20	20	20			
6.26		30	20	20	20		
8.2			30	20	20	20	Yellow
9.02				20	20	20	Yellow
4.3	20	20	20	20			
5.35	30	20	20	20	20		
5.31		20	20	20	20		
7.31		30	20	20	20		
7.3		30	20	20	20		
7.35		30	20	20	20	20	
8.31			30	20	20	20	Yellow
8.3			30	20	20	20	Yellow
8.34			30	20	20	20	Yellow Orange
9.03			30	20	20	20	Pale Yellow
4.45	20	20	20	20			
6.45		20	20	20	20		
7.4		30	20	20	20		
7.44		30	20	20	20	20	
9.04			30	20	20	20	Yellow
6.25		20	20	20	20		
8.25			20	20	20	20	Yellow Orange

This chart confirms for you

— where the natural base is ideal for the colour you apply

— where you might choose to pre-lighten the hair

— what peroxide strength you might use

20 or 30

— what bleached base is ideal for toning

Yellow

If the square is blank it usually means:

the application is unusual (eg. Black on naturally light Blonde hair)

the application is not practical (10.1 is difficult to achieve on Dark Brown hair)

More Fashion Shades
Use these colours on highly bleached hair:
7.1b, 8.1b, 9.1b, 8.3b, 8.5, 9.5, 20, 21, 22, 55, 58, 77, 8.2 (always use double amount of oxydant with 8.2).

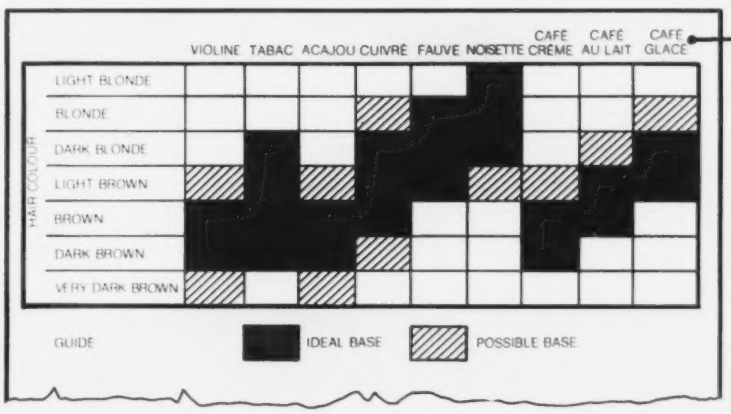
Mix with 10 volume oxydant and apply to towel-dried hair Development time 25-35 minutes. Add a little warm water — massage to loosen excess tint, then rinse and gently shampoo.

An important exception on a long list which needs to be emphasised by the lecturer. Easily missed by the student attempting to 'skim' read.

Preparation of Colour:
Amount of Lotion (Hydrogen Peroxide)
FULL HEAD: 1 tube + 60cc (2¼ oz)
REGROWTH: ½ Tube + 30cc (1⅛ oz)

Strength of Liquid
(Hydrogen Peroxide)
NORMAL TINTING (maximum coverage 6% (20 vol)
TINTING LIGHTER AND COVERAGE 9% (30 vol)
SPECIAL MATT EFFECTS, PASTEL SHADES ON BLEACHED HAIR AND MORE PRONOUNCED RESULTS 3% (10 vol)

'Lotion' 'Liquid' — both words refer to the same bottle of fluid — this just adds to general confusion for the student.



The use of French words is not uncommon.

Textbooks

Many lecturers are justly wary of using text books but from time to time they may be necessary. The difficulty for students can be cut down:

- by providing a photocopy of the specific passage or diagram if there are not enough books for everyone, or if a permanent record of the passage would be useful.
- by being absolutely specific if asking students to find it themselves e.g. page, paragraph etc.
- by preparation in class – giving students some indication of content
- by checking afterwards (orally or in a worksheet, or practically) whether students have fully understood the contents.

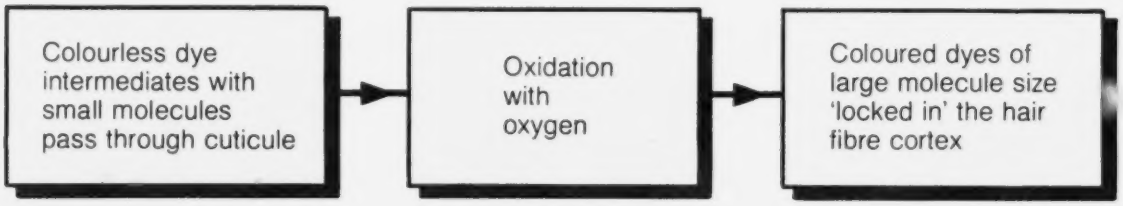
Students may be confronted by something like this:

OXIDATION HAIR DYES — PERMANENT DYES

Certain colourless chemical compounds will combine with oxygen and form dark coloured oxidized compounds. Such compounds are pyrogallol, aminophenols, and diamine derivatives which are known as dye intermediates. These have small molecules which can pass through the pores of the cuticule and enter the cortex. Here they join the oxygen and form large molecules of coloured dyes that cannot leave the fibre and are 'locked in', permanently increasing the durability of the hair colour. The oxygen for purposes of oxidation is obtained either from the air (21%) or from 30 volume hydrogen peroxide containing a little ammonium hydroxide. The main ingredients of oxidation dyes are para-phenylenediamine, meta-phenylenediamine, para-toluylenediamine, diaminophenol and ortho-aminophenol.

We can't remove all the difficulties in the path of the student, and if a hairdresser needs to know the main ingredients of oxidation dyes there is no escaping words like paraphenylediamine. However, there are a number of ways students could be helped to understand a passage of this sort.

For example the process involved could be summarised in a flow diagram:


Colourless dye intermediates with small molecules pass through cuticule
Oxidation with oxygen
Coloured dyes of large molecule size 'locked in' the hair fibre cortex

The following are examples of questions you could use on worksheets:

1. List some dye intermediates

2. Before combining with oxygen these have **large** / **small** molecules

   After combining with oxygen they have **large** / **small** molecules

3. The durability of the hair colour is permanently increased by .....

   .....

4. List the main ingredients of oxidation dyes .....

   .....

The information in this passage could also be summarised in note form on a handout or on the blackboard.

Handouts and Worksheets

Handouts from craft skills teaching can be used for some of the following:

- to guide reading and note taking
- to guide revision and test knowledge
- to give instructions and to evaluate practical tasks
- to describe tools, equipment, materials and methods
- to keep as a record of information given.

Handouts provide students with notes, direct them in practical tasks, give reading or writing tasks or are a mixture of these.

Each example shows some of the problems encountered when using handouts with mixed ability groups and gives suggestions on how it is possible to help. In some cases just reading through a handout or changing the layout makes the information presented easier to follow.

Naturally, craft lecturers want to be sure that students understand and will use the notes in future. As with text books, poor readers may find these notes too difficult to read when they go back to them at a later date and will therefore lose some of the support which the tutor has tried to give them. This catering tutor found that by making the layout of the notes clear and uncluttered he also simplified the reading task.

Cooking

The purpose of cooking food is to produce palatable, safe and attractive foods. The longer heat is applied the greater the change in the food being cooked. Cooking is used to kill micro-organisms, to tenderise, to change textures or structures, to change colour, or flavour.

Cooking

Purpose

to produce food which is

- palatable
- safe
- attractive

Principle

- the longer that heat is applied
- the greater the change in the food

Uses

- to kill micro-organisms
- to tenderise
- to change textures or structures
- to change colour
- to change flavour

Diagrams are often used in the teaching of a craft either to show what a completed job should look like in plan or section, or to give students instructions or guidance in doing practical tasks. The more complicated a job is, the more complex the diagram will be, yet diagrams which contain too much visual or written information are very difficult to read.

Where diagrams are used it is important to remember that if labels are necessary, they should be large enough to be read easily; equally where diagrams are used to illustrate notes, the diagrams should not be so small that they are difficult to see.

Even lecturers who say that they avoid written work, use worksheets some of the time. They can be useful tests/reminders and many lecturers use a variety of ways to ensure that worksheets are a help rather than a hindrance.

Before giving them out

a) By explaining orally what was being asked for in writing so that students would find any questions much easier to read

b) By advance preparation of students for any difficult words or diagrams so that when they read the worksheets students will find it easier.

On the worksheets

c) By using language that is simple and as accurate as possible

d) By ensuring that the print and reproduction is as clear as possible. Print that is indistinct is much more difficult to read

e) By providing multiple choice answers.

When students are involved in doing a job or conducting an experiment, they have to write down what they have done or what they have observed. Students who are not confident about writing can be guided and eased into this task by ensuring that they know exactly how much and what they are expected to write. If you want students to write notes or answers onto a handout then you can make sure they are not intimidated by this task by:

- indicating clearly how much they need to write, (will one word do or are sentences or paragraphs necessary?)
- helping those you know have difficulty in writing by starting off sentences for them or giving skeleton notes for them to fill in.

They may otherwise spend a great deal of time and effort writing far too much or writing down unnecessary details. One tutor helped by giving a worksheet which guided the students' response. The tutor found he had to explain when a one word answer would do and when a whole sentence was absolutely necessary. He also found that giving the spellings of key words which he knew the students would have to use, made the task easier.

Handouts

A summary of points:

- the student who had difficulty with handouts will find it easier if they are read through first as students can then ask if they feel unsure of any of the information given. Notes which are put away unmarked and unread into a folder are unlikely ever to be looked at again. To avoid this students can be encouraged to:
  - — ask about words or phrases they do not understand
  - — underline important words or phrases
  - — use a coloured felt-tip to pick out the important bits clearly.

By working on the handouts in this way students will be more likely, when they refer to it at a later date, to remember which bits of the writing were important and why. The important parts will also stand out clearly and the reading load may be reduced.

Layout

Layout can be an important factor in the readability of a handout. To make sure that handouts are more easily read you may use

- spacing
- underlining
- a good use of upper and lower case
- paragraphing
- numbering of points
- colour to emphasise key words or phrases
- diagrams

A well laid out handout will **look** easier to read than a cramped one.

Handwriting

Not all lecturers have clear handwriting and this can become more unreadable when a handout is photocopied. If the student struggles to understand the writing itself then the information given in the handout will take second place. Students who are not fluent readers will not be able to make informed guesses about what a word might be and the task of reading will be made very much harder for them.

Language

Everyday language and simply constructed sentences are easier to read and far less forbidding than long, complex passages. Much of the language and terms of the trade will be new to students and they will need to concentrate their efforts on learning to read and write these. You can help by making sure that these are the only 'difficult' words and phrases you use.

READING BECOMES EASIER the more you do of it. It becomes more difficult the less you do, so avoiding reading tasks entirely will not help the student with reading difficulties.

READING IS EASIER if it is about something you have done, so reading tasks given after practical experience are more effective than those given before.

READING IS EASIER if it is done in comfort and with a minimum of pressure. Reading aloud is a special skill and can be very frightening to students with reading problems, so students are better off doing silent reading.

READING IS EASIER when the text is perfectly legible. Poor copies, difficult handwriting, faint chalk marks, etc. will all make it more difficult.

READING IS EASIER when the language used is familiar to the student. This usually means that tutor-prepared notes are better than text book language.

READING IS EASIER when not too much is contained on one page, so handouts need careful layout.

Access Skills

A student following a craft course will need to be able to select and organise information as well as read and understand individual words and sentences. Knowledge of the common classification systems of libraries, the use of an index and contents list and the ability to skim the words on a page in order to pick out the important points are all useful access skills which will help students to study independently. Students on a Landscaping and Horticulture course were given the following worksheet to work on in the library.

LIBRARY WORK

Find out all you can about the difference between:-

AEROBIC BACTERIA

and

ANAEROBIC BACTERIA

In order to begin to answer this somewhat open question, students needed to be able to:

- decide whether to look up the word 'aerobic', 'anaerobic' or 'bacteria' in a dictionary or textbook.
- if the answer was to be found in a textbook they needed to know how to look up the classification in the subject index and whether to look for 'Bacteria' or 'Aerobic'
- having found the correct section, they would then need to use the contents and index of the books in the section.

The worksheet could have been modified by breaking the task down into these stages and in giving more guidance concerning the 'differences' the question was looking for. The lecturer had thought that by giving students plenty of room to provide an answer, the question would be less daunting, however for those students who had little idea of where to start, the empty space needing to be filled was discouraging.

If text books or other written material are to be recognised as the vital tools from which to learn the trade, they need to become familiar and well used, and many students require help to make the most of what is provided. The ability to turn up the relevant page and find the information asked for, does not come naturally to everyone. It is useful to point out to a class the way in which the book is specifically laid out to enable the reader to find what he is looking for. For instance:

- the CONTENTS page or list of chapter headings will show the main subject divisions, and where in the book they are to be found
- the INDEX will give precise page numbers, but students may need some practice in deciding which word to look up
- SUBHEADINGS within each chapter can be quickly scanned till the section required is found
- the BIBLIOGRAPHY can be the starting point for finding other books, probably available from the college library, which will be useful for project work
- CHARTS, CONVERSION TABLES and all sorts of useful information like the addresses of organisations associated with the trade may be found in a text book. Students often don't realise how much valuable reference material they are carrying around with them at the bottom of their sports bag.

Sometimes it is helpful to invent 'Search and Find' exercises, using the text books. The following example, designed for catering students is based on "The Theory of Catering" by Kinton and Ceserani. It aims to train the students in the use of the Contents Page and Index, and to encourage them to skim a page quickly to get a general idea of the sense, and to scan it for key words which lead to the specific information required.

SEARCH AND FIND IN "THE THEORY OF CATERING"

1. Study the **Contents** Page and find the chapter on Kitchen French. Scan through the subheadings till you come to Vegetables. What is the French word for vegetables?
   (Legumes).
2. Study the **Index** in order to find the section on uses of poultry. Give one of the for a suitable menu using an old hen.
   (Creme Reine, Sauce Supreme, Consommé de Volaille, or Cock-a-leekie).
3. Look up the **Chapter** on Commodities and find the section on spices. What is cinnamon?
   (The bark of small branches of the cinnamon shrub).
4. Find the section on electrical terms. What, according to Ohm's Law, equals volts?
   (Amperes x Ohms).
5. According to the section on examinations, what is the object of learning?
   (To enable a person to become a more useful member of society).
6. What, roughly, is the proportion of carbohydrate in potatoes? *(18%).*
7. Do you hang quail? *(No)*

It will be seen that in this exercise above, the student is left progressively to his own devices. At first he is told exactly how to look up the information (first on the Contents Page, then the chapter, then the sub-headings); later he is merely helped with the name of the required chapter or section, then ultimately left to find his own way to the answers.

In many courses there is a need to read and understand charts and tables. Some students may not fully understand visual representations of number or the conventions of tabulated information.

A catering, hairdressing or construction student may need to refer to a metric conversion chart of volume e.g.

Litres	*Litres or UK gallons*	*UK gallons*
4.456	1	0.220
9.092	2	0.440
13.638	3	0.660
18.184	4	0.880
22.730	5	1.100
27.276	6	1.320
31.822	7	1.540
36.368	8	1.760
40.914	9	1.980
45.460	10	2.200

The chart would normally be read from the middle to either the left or right hand column and in order to use the chart successfully the student would need to know this. In addition he would need to know methods of calculating litres or gallons over 10, and have a fairly clear understanding of decimal points and place value.

Just as we need to use the right tool for the job, to read effectively it is important to use a style appropriate to the task in hand. There are a number of styles to choose from.

Skimming

Are students able to pick up a book or packet, and, rapidly, digest enough surface information to decide whether it is going to be useful or not?

Scanning

Can they, rapidly, look through a page or list to spot the one word which they are looking for?

Intensive Reading

Can they read instructions with sufficient accuracy to enable them to follow and complete a task without error?

Critical Reading

Are they able to read and consider a passage and absorb its impact in the light of prior reading and information, sorting out fact from persuasion?

Each of these reading styles plays a part in mastering a craft and it is important that lecturers ensure that students practise and develop such skills as they crop up in the craft class. This will not only benefit those with poor reading skills but those without problems gain the benefit as well because information provided becomes more accessible. The more you know about how we read the more you can help students.

Individual Differences

Although most craft students will have an interest in their craft skill in common, they will have varying abilities in writing.

Craft lecturers will need to assess how adept a student is in terms of the craft and will judge progress on how the task in hand is tackled and on the final product. In doing so she may leave one student to make a souffle from start to finish, while another may need more careful guidance through each step in the process. Each of the students will be given such help according to their known strengths and weaknesses. In much the same way the lecturer may learn that a student may need the same step-by-step guidance in written work or in calculation. As the lecturer takes into account the individual differences in her group in practical work so she should bear this in mind when setting written tasks associated with the craft.

Any group is liable to have students with a wide range of ability in writing. The following is an example of a number of students following craft courses.

GORDON

Standard wallpaper is washeble eg it is easy to come ~~on~~ on and it dose ~~not~~ ab orbe warter. Washanball wallpaper will not absorbe warber.

Gordon had virtually left school at 14 since he had spent much of his time absent from school or else had missed individual lessons. His written work had suffered as a result.

GARY

I would start perpareing the room takeing out of the furetrure

Gary's painting and decorating lecturer could not 'work him out' at all, since though Gary was a willing worker, he would at times become very unco-operative and sullen. Eventually he admitted that he was almost illiterate and therefore naturally he was afraid to allow others to find this out.

ROGER

If I wos a supervisor and had men working wder me I would make sure that they would not put themselves or others at risk, these would be,

(a) Always wear overalls and work boots.

(b) Always knock on a door before entring

(c) Always test equipment before use as it may be faulty.

A very articulate and able student who left school with no qualifications as he felt that there was nothing of any practical use to learn there. Roger's craft lecturer found that though he was a careful and dexterous student, Roger lacked the numeracy skills he needed to carry out some jobs, and that his writing, although accurate, was extremely slow.

SUSAN

In moden kitchen of today moe work is done by whoe as in a large taditonal kitchen ose past have has or her partigler job to do.

Susan was persuaded by her parents to attend college. She chose to do catering and found that she was actually quite good at it and that she could succeed where before she hadn't even wanted to try. Because she'd missed a lot of school Susan's numeracy and literacy needed improvement so that she could calculate quickly and read menus and recipes etc. Susan was most worried about taking her turn on the till in the training restaurant as she needed to work quickly and accurately to give the right change.

All these students needed some help with literacy or numeracy and their ability to express their thoughts on paper varied considerably. Roger was the only student who was willing to write when asked and had a clear idea of how to structure what he wanted to say. All the other students needed some help in spelling, punctuation, organising or ordering their thoughts and expressing themselves in writing. The next section suggests some of the ways of dealing with the wide range of written ability craft lecturers are likely to come across.

Approaching Writing

Student comment

"He writes the notes we'll need for the exam on the blackboard but I just can't keep up or spell half the words. For the first couple of weeks, I tried rewriting the notes at home but I'd missed out so much that it didn't make sense and I'd been trying so hard to get them down that I couldn't remember what he'd been talking about. I was fed up and anyway it's the practical that's important, and I could just imagine what he'd say when he looked at my notes. My mate said I could borrow his notes to copy up so the lecturer will never know how bad I am at writing and anyway I can't concentrate on what he's talking about."

"I can understand everything we're doing and explain it so some of my friends who don't catch on so quick. I can answer any questions the tutor asks me but when it comes to reading the book and writing answers — that's when I'm really behind the others. After my last homework, he said 'I'm really surprised at you — you're so good at the practical but you'll have to work harder at the theory and do something about your handwriting and spelling or you won't get far' — it's just like school."

"They go on about my notes and spelling and that, but you don't have to read and write on a building site. You don't have to order materials, do maths or look things up — it's how you do the job that matters. Take my brother — he can still hardly write anything but he got the craft certificate and the Advanced and some Awards too. I wish they'd get off my back."

Identification of Problem

Many students when asked can identify their own areas of difficulty:

In many cases these are

- spelling
- handwriting
- word flow — spoken
- word flow — in writing
- speed
- phrasing and composition

Students also fail to understand the relationship between the literacy and numeracy skills used on a college course and the work they do in the work place.

These difficulties mean that the effort involved in writing leads to:

- skimpy or limited notes which have little use in the future
- distraction from the content of lecture, hence lack of understanding of content
- reluctance to learn the theory

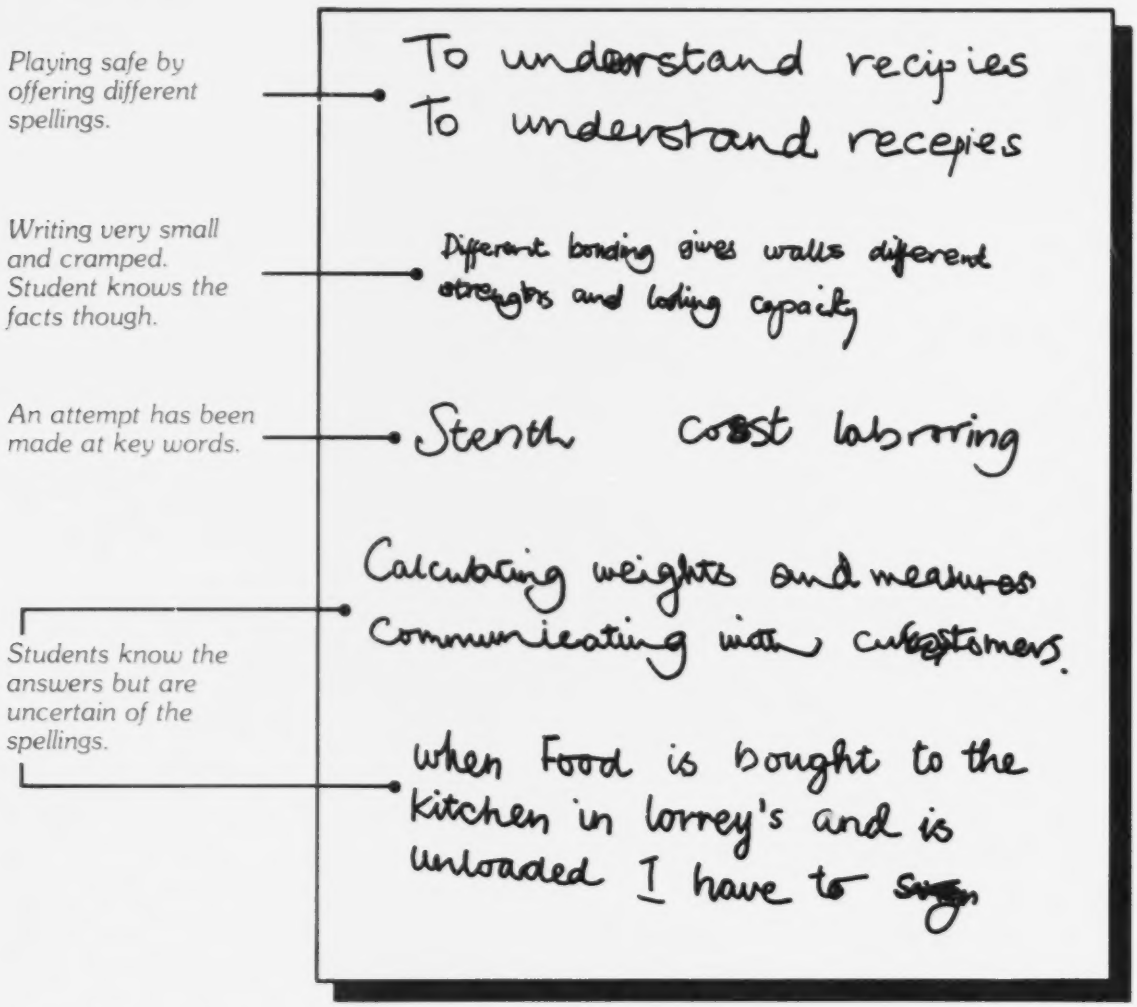
Problems faced by the craft lecturer and students

By the age of 16, students with poorly developed literacy skills often have negative and defensive attitudes towards writing and reading as well as a number of strategies to avoid anyone finding out. Craft lecturers are then faced with the problem of making the written side of the theory palatable to

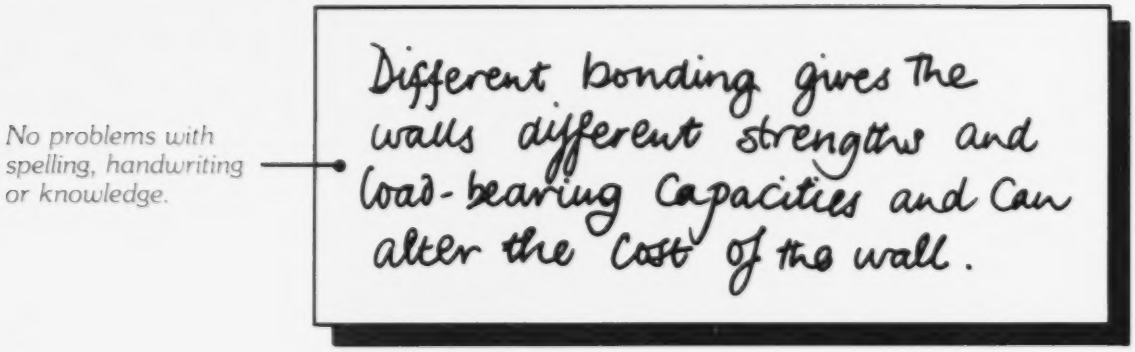
the student. The lecturer also needs to devise means of assessment which show a true measure of a student's knowledge and interest. If this is done it will soon lead to increased motivation to improve literacy skills in the context of the craft course if nowhere else.

Usually both lecturers and students know that the ability to communicate on paper is not absolutely necessary to a craftsman in his daily work. Thus lecturers have to find ways of 'selling' the fact that literacy skills make life easier - and this within the time constraints of the course. A lecturer may also face the problem of knowing how to teach his craft but feels very unsure of himself when it comes to teaching literacy skills.

Here are some samples of student's work:


Playing safe by offering different spellings.
To understand recipies
To understand recepies
Writing very small and cramped. Student knows the facts though.
Different bonding gives walls diferend
Sterth cosst labrring
An attempt has been made at key words.
Calculating weights and measures
Communicating with customers.
Students know the answers but are uncertain of the spellings.
when Food is bought to the kitchen in lorrey's and is unloaded I have to

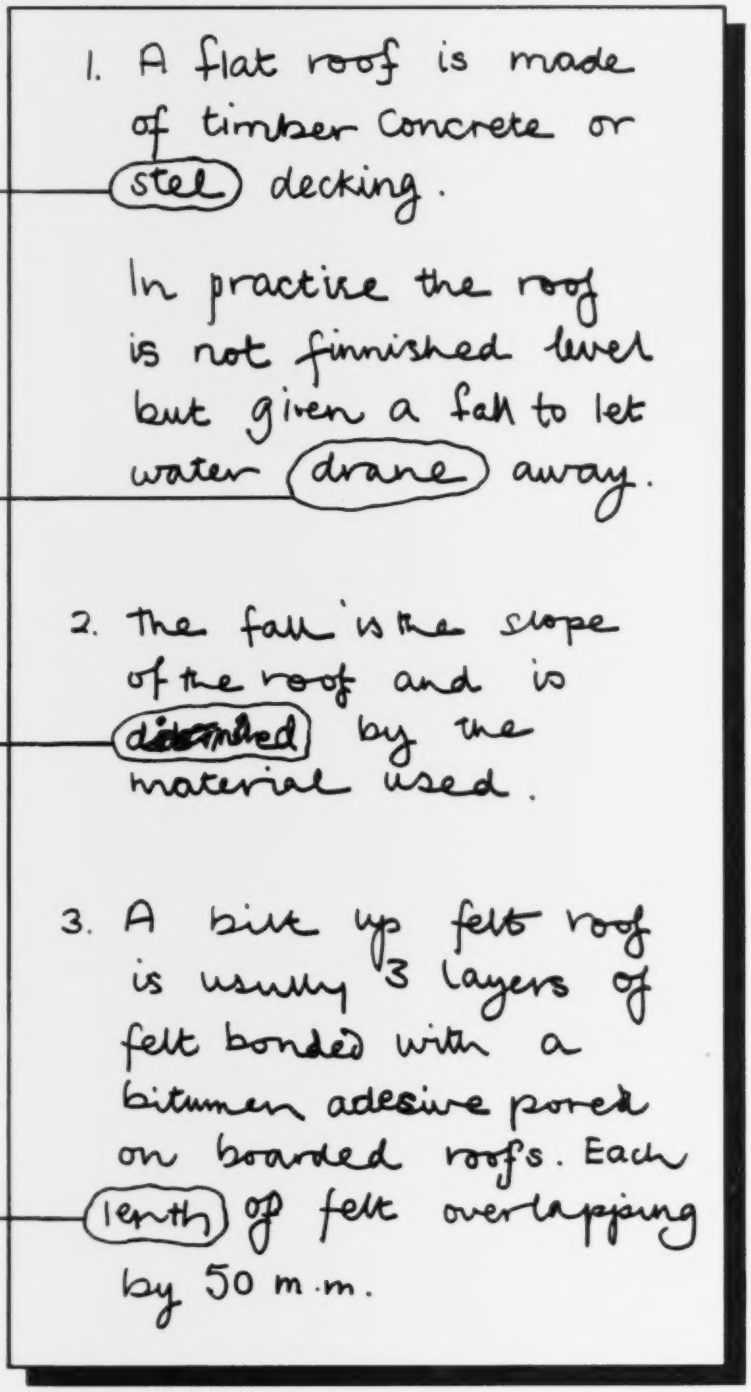
The craft lecturer may have been expecting something like this:


No problems with spelling, handwriting or knowledge.
Different bonding gives the walls different strengths and load-bearing capacities and can alter the cost of the wall.

The craft lecturer will have to deal with a variety of examples of students' writing and may in some cases need to decide what can be done to improve students' writing in particular the spelling of technical words. The written answer which follows has been marked and some of the things it indicates about the student's writing ability are pointed out.

The student had in front of him a handout on Flat Roofs and had to answer the following questions.

1. What materials can be used for the construction of a flat roof?
2. What is the meaning of the word 'fall'?
3. What does a built up felt roof consist of?


1. A flat roof is made of timber Concrete or steel decking.
In practice the roof is not finnished level but given a fall to let water drane away.
2. The fall is the slope of the roof and is determined by the material used.
3. A bilt up felt roof is usully 3 layers of felt bonded with a bitumen adesive pored on boarded roofs. Each lenth of felt overlapping by 50 m.m.

"steel"
an important word which if it is not corrected would make writing impossible to understand.

'drain'
This has been spelt like 'plane'. It is still possible to understand it, but the student may benefit from learning different spellings of same sound eg. "plain", "plane", "drain".

the word **'determined'**. It would be worth checking that the student understood the word as well as encouraging him to write it clearly, so it can be checked by him. Uncertainty about spelling is often masked in this way. Since 'sounding it out' will not help, the student needs practice in reading it and writing it frequently.

"length"
the 'g' is almost silent in this word. As it is a word which will come up often in the building trade, the way to correct it may be to suggest a 'spelling pronunciation' i.e. student to say it to himself slightly exaggerating the sound 'g'.

It is important to remember that there are a lot of good things about this piece of work. The student has spelled 'timber', 'concrete' and 'bitumen' correctly, all of which may be required later. As many of the words in the answers were in the passage on Flat Roofs students had in front of them it is possible to find out if students can copy a word correctly. However, since typewritten or printed letters are often very different from handwritten words copying it is not always as easy as it seems.

In dealing with students' spelling, craft lecturers will need to consider some of the following points:

- some words are not written the way they sound so no amount of 'sounding out' will help (e.g. built, board.)
- in many cases, the more often a student sees a word spelt correctly the quicker he will learn it.
- if a student's handwriting is poor or irregular or if there are a lot of crossings out, it will be more difficult for him to see whether he has spelt it correctly, (e.g. determined.)

Presenting Written Tasks

In the following passage a craft lecturer talks about the way he identified and tried to ease difficulties faced by some of his students.

> I'd always thought that some of the students weren't exactly bright and knew they wouldn't do very well. In fact, some of them were a nuisance. After all they say that if you're thick, go into building! One year though there were two lads who were good in practical sessions – they had an aptitude for the work and knew their stuff verbally. In theory sessions though, one acted like a dummy and the other was a loud-mouthed pest and I never got any written work out of them. After a few weeks of that, I'd had enough and I asked them what they thought they were doing. The problem was something that just hadn't dawned on me – they couldn't read easily, let alone spell or write neatly. They were feeling good about the practical side but thwarted by the written side of the theory – not the content. Being a dummy or a pest were ways of avoiding exposure.

He then listed the reasons why and the occasions when he asked students to write:

- to record information for future use
- to test understanding of theory and technical terms
- to test memory/attention
- to test students' research for information from books or other sources
- dictation, notes, single words, labelling diagrams, sentences, paragraphs
- during the theory session
- for homework

Students, he noted, had difficulty in theory sessions with:

- using dictated notes for revision because they could not read them back
- concentrating on the content of the lecture because of the effort needed to write
- giving the lecturer a true measure of his interest, attention or understanding
- avoiding the frustration they felt at school

Possible solutions to consider

What then can craft lecturers do to make sure that the theory content of their craft is absorbed by students even if they face difficulties with reading and writing? Three craft lecturers describe their methods:

Barbara Hall
Catering lecturer

"When I dictate notes, I try to expose the students to as many different ways of expressing things as possible. Quite often there'll be the question 'What does that mean?' and when I explain or ask someone else to explain one of them is sure to ask why I didn't say that in the first place. I can use this approach with the students because they respect the way I teach in the kitchen."

Keith Wood
Construction lecturer

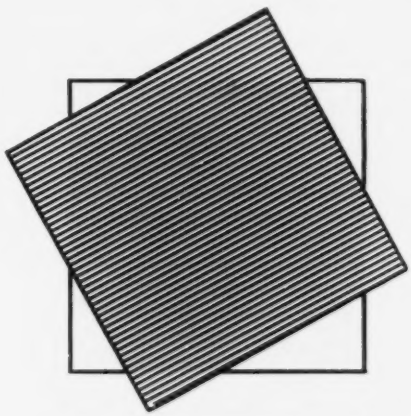
"I sympathise with the students when I ask them to do any written work - I wasn't so hot when I left school and I can remember the agony of writing up the assignments. I used to freeze as soon as that pen was in my fingers, so I try to encourage the students into writing bit by bit.

If there are some students who find writing difficult, it's either spelling or lack of practice or confidence in putting things on paper. It's no good telling them to try harder, they need to be offered positive strategies for improving their work.

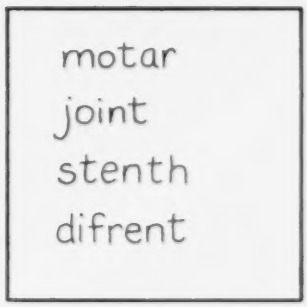
When the problem is what to write, I encourage them to write down what they'd say if I ask them to answer the same question verbally. It's amazing how many people think you can't write what you say - that there has to be a 'proper' way for writing things.

'Do you remember the day you were learning to use a brick laying trowel and mortar to lay a bed-joint? It took everyone at least half an hour of practice to get the wrist-flick right so you got the mortar from the spot board on to the bricks. Well, getting the spelling right is just the same, I'll show you what I mean. Give me four words you can't spell — right, here we go:

LOOK at them because you're aiming at writing them correctly on another sheet of paper, from memory.



COVER them up

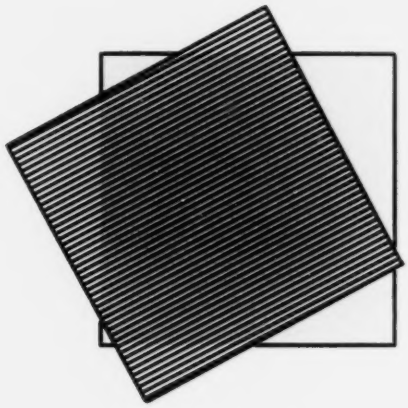


WRITE them down from memory

mortar
joint
strength
different

CHECK to see how you've done

mortar ✓
joint ✓
strength ✓
different ✓



Fine, have another go - at all four of them.

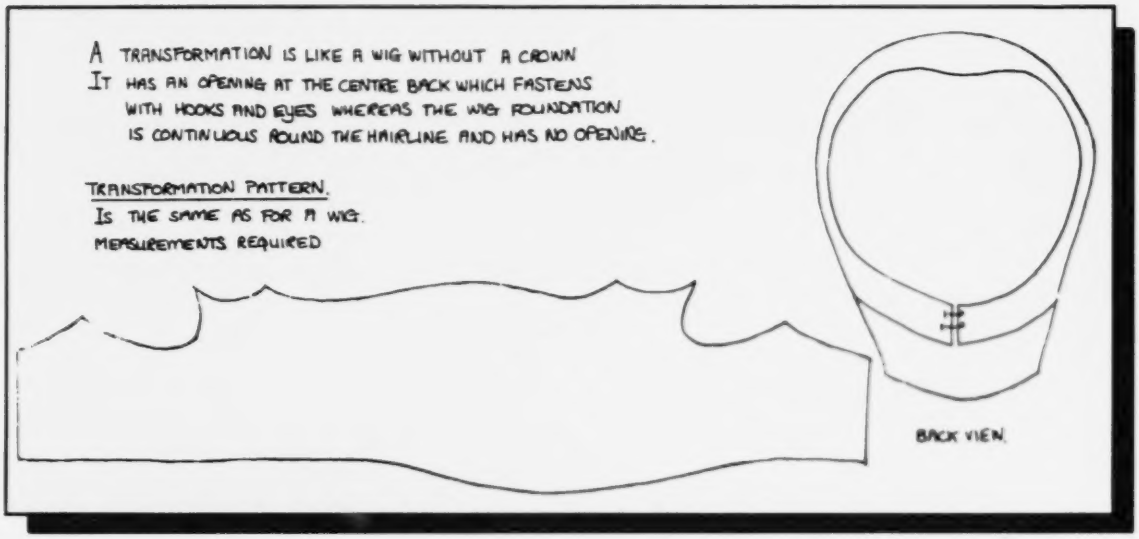
If you jot these words down now and again during the week, you'll suddenly find you don't have problems with them. The two tricks are that you never take too many words at once and that you look at them with the intention of writing them down from memory.'

Bob Tulley

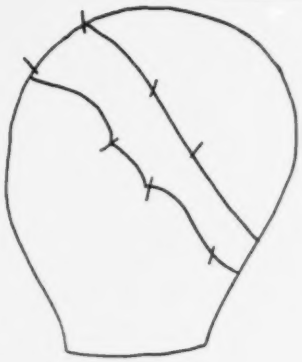
Hairdressing lecturer

"The whole course is a matter of practice, whether it's practical or paper work. It's also a matter of people knowing what's expected of them, but those expectations have to be realistic — you can't con a group of students into believing that the only way to prove they can make a wig is to write a three page essay on the subject. I changed my presentation of theory for two students in particular but found that the results for the whole group were surprisingly good.

At first, I use structured worksheets with OHP transparencies, for the students to take away an example of the layout for notes and I finish the topic with a reference handout. Then the students can use the layout of the handouts and worksheets for their own work later in the course. They also get used to my handwriting.

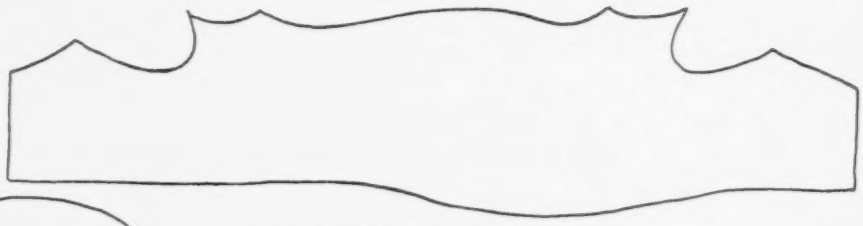

A TRANSFORMATION IS LIKE A WIG WITHOUT A CROWN
IT HAS AN OPENING AT THE CENTRE BACK WHICH FASTENS WITH HOOKS AND EYES WHEREAS THE WIG FOUNDATION IS CONTINUOUS ROUND THE HAIRLINE AND HAS NO OPENING.
TRANSFORMATION PATTERN.
IS THE SAME AS FOR A WIG.
MEASUREMENTS REQUIRED
BACK VIEW

30



MOUNTING PATTERN

1. CHOOSE A WOODEN BLOCK ½" LARGER THAN THE CIRCUMFERENCE MEASUREMENT.
2. POINT PATTERN TO BLOCK

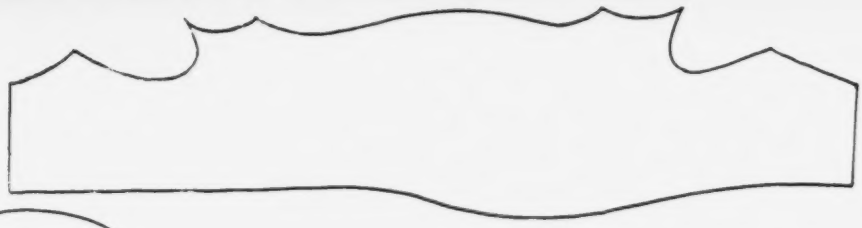


CIRCUMFERENCE BAND

1. USE ½ - ¾ cm GALLOON
2. START AT CENTRE BACK
3. FOLLOW PATTERN ENDING AT CENTRE BACK.
4. CUT OFF, LEAVING ENOUGH TO TURN OVER IN A SMALL HEM AT EACH SIDE OF CENTRE BACK.
5. SEW HEMS NEATLY LEAVING ¼" GAP BETWEEN THE TWO

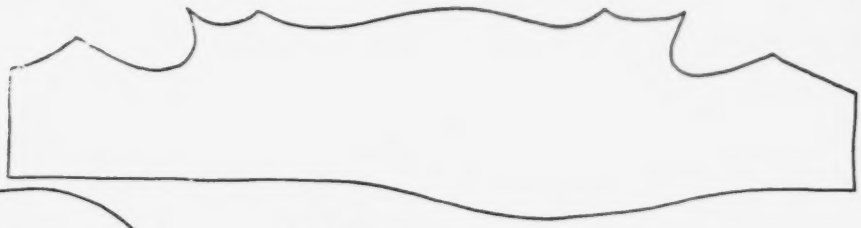
EDGE GALLOON

1. USE ¼ - ½ cm GALLOON.
2. START AT CENTRE BACK
3. OUTLINE ALL OUTER EDGES OF FOUNDATION [HAIRLINE AND CROWN]
4. MAKE A NEAT JOIN WHERE TWO ENDS MEET.



FOUNDATION NET

1. CUT FOUNDATION NET ROUGHLY TO SIZE
2. POINT IN PLACE, LEAVING THE OPENING AT CENTRE BACK.



SEWING I.

1. SEW BOTH SIDES OF CIRCUMFERENCE BAND.
2. SEW THE INNER EDGES OF GALLOON AT HAIRLINE AND CROWN EDGES AND ALSO CENTRE BACK OPENING.
3. USE SMALL NEAT HEMMING STITCHES.

FIG. A

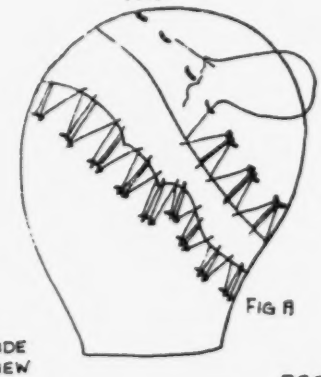
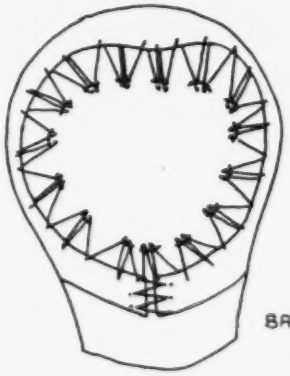


FIG A

SIDE VIEW

FIG. B



BACK VIEW.

BRACING.

1. BRACE ALL AROUND OUTER EDGES. [FIG A]
2. THE TWO CENTRE BACK EDGES CAN BE BRACED ACROSS TO EACH OTHER. (FIG B)

Summary of points to consider when asking students to write

- In order to read, you have to recognise words and understand the grammar or the way words are arranged. Then it is possible to understand the meaning of the passage.
- To write, you have to know what to say and then recall the grammar and spelling to express the thoughts on paper.
- Without understanding and knowledge, i.e. something to say, nothing can be written.
- If a student does not have the skills of spelling, punctuation and clear handwriting, he will find it difficult to communicate his knowledge in a meaningful way on paper.

At the beginning of the course it is worthwhile taking time to identify and assist those students with literacy problems thus preventing loss of motivation when too many mistakes occur in writing. It is possible to help by:

- not expecting students to write notes when a new topic is introduced,
- explaining using diagrams where necessary, and offering the spelling of new technical terms,
- giving structured worksheets for completion,
- giving handouts later with expanded notes and clear headings.

When marking written work, offer positive strategies for improving it (e.g. Look, cover, write and check.)

Provide practice in writing — particularly in areas relevant to craft.

Numeracy and the Craft Student

Most sixteen year old school-leavers will have some idea of the level of their own mathematical ability and be aware of some of their problems, although this may not be in any analysed way:

"When it comes down to 3 figure decimals I have problems"

This is often simply an awareness that if something looks too mathematical and involves complex looking figures then the mind becomes blank and gives in immediately - not knowing where to start.

A surprising number of students (and some lecturers in all fields) find themselves in this position when it comes to mathematics - an involuntary "fear" and lack of confidence sets in even before the task is tackled.

Some of the reasons for this include

- a failure to have grasped the basics - addition, subtraction, multiplication, division.
- poor ability in mental arithmetic (i.e. having little knowledge of multiplication tables or having little practice in adding and subtracting small numbers in his/her head.)
- the demands of examinations. (Students may have had to commit formulae to memory without fully understanding their function or what they represent.)
- a view of maths as an abstract subject with no relevance or application to any other subject.

Identifying numeracy needs

Having recognised that numeracy elements exist in a particular craft area (and it's difficult to think of even one craft where numeracy skill of some sort isn't required) how can craft lecturers help?

A craft lecturer has many advantages - particularly as he is generally seen by students as successful at the job and has the skills that they wish to acquire. If you've worked in the 'real world' as chef, hairdresser, plumber etc. and needed to calculate successfully then students may see this as a convincing argument even if they initially think it's going to be hard work and boring. Many craft lecturers will say: "Look I have enough problems getting them to learn how to wind a perm/make a Charlotte Russe/wire a lighting circuit etc. without trying to fit this maths in as well!"

However, if numeracy problems do arise they may hinder the teaching of diluting the solution/weighing the ingredients/choosing the fuse size etc. and students with perfectly good practical abilities may fail a course for want of basic skills.

Identifying the problems

Having made a list of the numeracy skills required for a particular craft, problem areas need to be identified and recognised by both the lecturer and the student: An initial basic maths test may prove to be a good diagnostic tool for a lecturer but won't necessarily mean much to a student.

One successful way of getting students involved in identifying problems and doing something about it is to make an initial assessment job orientated. For example, early on in the course, students could be presented with a situation where real numeracy skills are needed to complete what is obviously an essential part of the job e.g. for the hairdresser — diluting hydrogen peroxide, mixing tints; for the chef — weighing ingredients, scaling recipes up and down, costing meals; for the engineer — measuring materials, calculating costs, working out timeplans. In each case students can see that a craft job can't be completed properly without basic numerical knowledge. By this method students can see the need for the maths the craft lecturer is doing.

Craft lecturers need also to identify any potentially difficult areas for students. Incidentally, a lecturer who has in the past experienced difficulties with his own mathematics may be in a good position to help students with problems. One lecturer pointed out that where he had to think twice he knew this would be an area where students would have problems and so prepared work accordingly by thinking of different ways to explain the concept or operation required, by having visual aids available - and by acquiring plenty of examples for students to practise on.

Some general points for success

1. *Relevance* - make the examples used real, worthwhile and relevant to the trade.

2. *Simplicity* - when introducing a skill or concept which has numerical form try and choose the first few examples so that the arithmetic doesn't get in the way of the idea you are trying to teach. Once the concept is grasped the numerical work can be made harder:

   e.g. Fuse sizes: having introduced the idea that the size of fuse required can be found by calculating the current flowing from:

$$\text{Current (amps)} = \frac{\text{power (watts)}}{\text{potential difference (volts)}}$$

   introduce an example such as:

   "A hairdryer runs off a 240 volt supply and has a power rating of 480 watts. What current flows?"

$$\text{Amps} = \frac{480}{240} = \frac{48}{24} = \frac{4}{2} = 2 \text{ Amps}$$

By ensuring that the example works out with easy whole numbers the concepts and new ideas can be absorbed without the problem of decimals getting in the way. Once confidence has been gained then more difficult questions can be used.

3. *Practice* - Once a student has successfully learnt a new numerical skill the lecturer should have plenty of examples available for the student to practise on. It's surprising how often students, even with little confidence about maths, want to carry on doing the same sort of questions when they know they can do it.

4. *Reinforcement* - It is important to keep on introducing situations where students need to apply numeracy - weigh, or measure (rather than do it yourself or getting a technician to do it). So, instead of: "You'll need about 650 bricks to build that porch, go and get them." Say "This is the sort and size of porch we want, you know the brick coverage rate, how many bricks will you need?"

5. *Easy access to information* - For those students who don't know their tables then it may be helpful to encourage them to use a multiplication grid e.g.

1	2	3	4	5
2	4	6	8	10
3	6	9	12	15
4	8	12	16	20
5	10	15	20	25

This is, in the long term, better than using a calculator, since it at least shows where the results are obtained rather than just appearing on a screen. Yet it still gives a result without the lack of tables getting in the way and hopefully students will become familiar with the basic tables. By using such a grid, students will also get used to using a numerical table.

6. *Presentation of material* - Presentation and lack of ambiguity are also important. Below is an extract from a worksheet for plasterers which was used to introduce basic ideas of how to mix plaster, key walls, calculate amounts required etc. The question given is a common type of question. Unfortunately, the way it has been presented can lead to confusion for the student lacking in confidence in numerical and language ability.

MEASUREMENT

A wall 5¾m. by 2½m is to be covered to a depth of ⅝" in plaster.

(To convert " to mm multiply by 25:40).

What volume of plaster would be needed?

Answer in cubic metres.

① . here indicates an abbreviation — but can also bring to mind a full stop or decimal point for some students.

② " here represents inches but could be confused with quotation marks.

③ 25:40 — an unfortunate typing error which leaves the intended decimal point looking more like a colon or is it a ratio symbol?

The calculation involves the multiplication of three figure decimals which is quite a difficult process and will present problems for some students.

Areas of numerical work

From looking at the lists of numeracy examples in different trades it is obvious that the spread of examples is very wide. Some common themes occur, however, which can be used for practice.

1. Metrication

The comparison and conversion of metric and imperial units is one area of work which constantly crops up. Many students and staff alike admit to having the same feelings of uncertainty about this process and yet for different reasons. One way round the problem would be to attempt to vet all written material and equipment used by students so that it was all in metric units. This, however, is virtually impossible - a quick glance through, for example, hairdressing product literature and instructions shows volumes of liquids variously described in:

'ounces (oz)'
'fluid ounces (fl.oz)'
'mL.'
'c.c.'
'½ bottles of'
'parts of - to parts of -':
'volume strength' etc.

Similarly, catering students will find different recipe books in grams and kilograms or ounces and pounds and oven temperatures in degrees fahrenheit, centigrade or Gas Mark. Whilst in the construction industry wood may be quoted as "3.1 metres of 3 x 2" - meaning a piece 3.1 metres long but 3 x 2 INCHES in cross section. Various methods can be used to tackle metrication although some are easier to grasp than others for less numerate students.

2. *Direct mathematical conversion*

Students could simply be presented with the information and then do exercises based on the figures provided:

eg. 1 metre - 1.0936 yards 1 yard = 0.9144 metres

Calculate $2\frac{1}{2}$ metres in feet and inches etc.

Whilst this can give accurate answers it can also turn out to be no more than a difficult mathematical exercise giving wrong answers. What is more it fails to pass on concepts of the relative physical values of the units concerned and thus proves to be of little use in most practical situations.

3. *Linear conversion charts*

These are available from, for example, the Metrication Board and can be useful as a referral system for use whilst attempting to complete a task. They can also be successfully used as an opportunity to introduce the ideas of approximation rounding up and down of decimal points and the concepts of when the need for accuracy arises.

4. *Conversion based on practical work*

An alternative method is to present students with various things to measure in both imperial and metric units. A worksheet could be produced which asks the student to work round the objects, fill in their results then use these and the pamphlets/charts (eg. from Metrication Board) to construct their own comparison table. The objects used can be relevant to the student's trade and the measuring instruments ones which they will use on the course.

Such a practical approach, despite being more work to set up, has many advantages for both student and lecturer.

- It gives the opportunity to get a feel for both sets of units and work out how they compare not only numercially but also physically.
- It gives the lecturer a chance to introduce students to some of the measuring equipment they will be using in their job and discuss them — how and when to use, degree of accuracy and sensitivity, calibration, zeroing, etc. This can be applicable for equipment ranging from small plastic measuring cylinders used in salons to micrometers used in engineering.
- It allows students a useful opportunity to master the use of the common abbreviations which will crop up in the craft.
- The concepts of estimation, approximation and averaging and their application to measurement can be introduced by looking at the figures obtained and the variety within them.
- The idea of when accuracy is important can be discussed. Students could be asked which scales should be used and how important errors are when measuring 20g of flour or 5g of raising agent. This would help them arrive at what are acceptable margins of error.

Estimation of Time

Scheduling, or the allocation of time to tasks and people, is a skill which seems to be required in many areas of work - hairdressing, building, catering, horticulture etc. It requires a sound knowledge of the craft as well as a logical approach and numerical awareness.

Students often do not grasp scheduling in an organised way, since they have to 'get on with the actual job' without being aware of the overall pattern or the final goal. As a consequence they often appear to be 'lacking in common sense' because they don't seem to use their time properly or be able to move smoothly from one task to the next.

Obvious areas of work requiring scheduling include:

- *Hairdressing* - the client's appointment system
- *Catering* - the preparation time leading up to service needs to be well used so that a properly cooked, hot/cold meal can be presented to the customer at the correct moment
- *Construction* - time needs to be allocated so that the various tasks involved in, say, building a bungalow, can be done in the correct sequence with the right materials and craftsmen available with the minimum of delay between each operation.

Scheduling a job requires knowledge of

- the "process" times (hairdrying, concrete setting etc.)
- the time a job takes to do
- the order in which the job has to be done.

As well as being able to work out the timing of a job precisely, it is also necessary to learn when it is safe to estimate and when various "human factors" will affect the timing of a job.

An example

The hairdressing appointment system has been chosen as an example since some of the principles involved could be applied to other trades. It is taught in a variety of ways. The example given is how one college tackles the subject.

Each student has to learn how to make appointments neatly, using time efficiently and without overlooking columns. They have various ways of learning this.

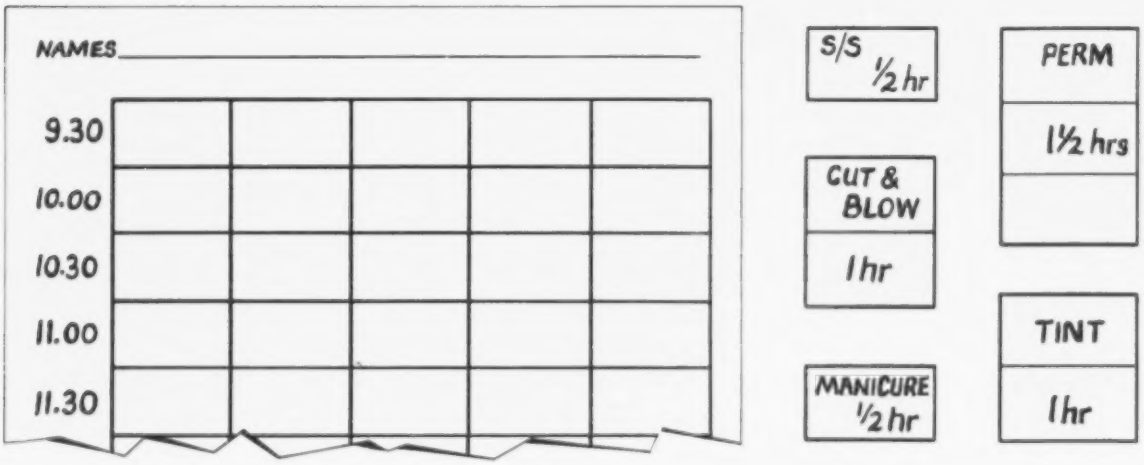
- They are taught in classes the layout of appointment books, how much time is allocated for each service and how much time to book out prior to lunch or the end of a session, in order to allow for a back-log.
- The reception desk has a book in which examples of appointment columns are illustrated showing normal time allocated for services e.g.

	Shampoo & Set	*Cut & Blow*	*Perm*
1st year student working time approx.	½ hr	1hr	1½hrs
Client's time in salon approx.	1¼ hrs	1hr	3hrs

The reasons for the time difference are discussed

- In order to help the sorting out process a simple teaching aid can be developed.

Each student has an appointment sheet with, for example, 5 blank columns and a pile of cards indicating a service and the time allocation required. The cards are cut to the same size as the time block required on the appointment sheet.



The student should then fit in as many of these appointment cards onto the sheet as possible. The different patterns and number of appointments achieved by a group are then discussed.

A typical column is then given to the students and discussed with regard to how to use their time, where to be flexible, order of priorities, reality of the situation etc.

A similar exercise could be tackled for caterers with regard to preparation, cooking and service times or with builders re-ordering of materials, sequence of jobs to be done, craftsmen time etc. The numerical skills of estimation, reading of tables, calculation of time and division of time into units are integrated into the development of knowledge of the craft.

Testing

Testing often involves some written material, but craft lecturers don't want students to 'fail' tests because they couldn't cope with the written parts. There are a number of ways of testing that can help lecturers avoid falling into the trap of testing reading and writing instead of knowledge of a craft.

By continuous assessment. Some of the suggestions made about reducing the reading load in course-content can provide a useful record of on-going student progress. Also useful are such things as projects and check lists, and student worksheets. It is important for lecturers to know whether the concepts were understood at the time.

Oral Questions. Where lecturers feel it necessary for students to write, they can provide oral questions, thus avoiding the possibility of students losing marks because they read slowly, or misunderstand questions.

Similarly, if testing a mathematical skill, a multiple choice format can be useful. It can test whether the student has the calculating skills and a concept of the correct magnitude of the answer. Thus the answers offered can include having the decimal place in the wrong position as well as a multiplication mistake e.g.

If a litre of emulsion paint will cover 25 m^2 of wall,
how much paint is required for a wall of 5m x 35m ?

(a)	0.7 litres	DECIMAL PLACE WRONG
(b)	7 litres	CORRECT
(c)	17.5 litres	MULTIPLICATION AND DECIMAL PLACE WRONG
(d)	175 litres	MULTIPLICATION WRONG

Putting the students at ease. If spelling, grammar, punctuation are of no significance in a particular situation, it may be worth pointing out to students that they will not lose marks for presentation. You can mark content without commenting on grammar, spelling, punctuation, handwriting etc, and students may find this much easier to cope with.

Spelling

If students can ask for spellings and look things up, it is unlikely to make them worse craftsmen – it may make them better. But it may give them extra confidence to cope with a test situation.

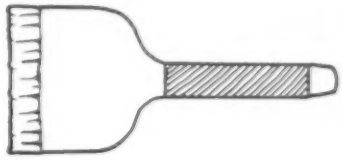
Setting the question. In setting test questions it is worth considering the variety of ways of putting a question. Some questions are more open than others and may require more thought and written composition. In testing a student's knowledge of the tools of the bricklayer's trade (in this case a bolster) some of the following ways of posing the question are possible:

What is a bolster?
(This is a very open question and a student may not know how much is required, and what kind of definition)

A tool used to cut a brick is a b — — — — — —
(The question gives some guidance as the the length of the word and its first letter)

A hammer and **are used to cut a brick**
(More information is given about the use of the tool)

This tool is called a
(The question uses a picture and looks for a name only)



This tool is used to
(The question is looking for the function of the tool)

Some students are reluctant to commit themselves to paper in a test in case they lose marks for writing, spelling, grammar or punctuation. It is important that they know to what extent their English will affect their marks.

It is important to know what you want to test. In numerical situations try to decide whether you want to test recall and use of a formulae - if so, keep the numbers easy to calculate; or whether you want to test calculating ability - if so, perhaps the information required can be given in the question.

Allowing marks for wrong answers. Often in a test it is easy to make silly mistakes. If students are encouraged to show clearly their working out it allows you to spot these and still give marks for knowledge shown and working out etc. even though the final answer is wrong. It also eliminates the possibility of the guessed or copied correct answer getting full marks.

Spelling and Vocabulary. Sometimes spelling mistakes can be ignored but if the student spells key terms incorrectly it is going to cause confusion not only on the course but in the work situation as well. Such words need to be spelled correctly automatically and habitually and, therefore, need identifying when they are first presented so that the student understands that their correct spelling is crucial to the learning of the craft. Putting marks through the word or altering letters, will only confuse the student with reading problems. The important thing is to give the correct spelling in the most readable form possible. It is a good idea for students to keep a record of such words. This could take the form of an equipment or ingredients list, thus stressing the role in craft rather than the English.

ALBSU
Adult Literacy & Basic Skills Unit

The Adult Literacy and Basic Skills Unit (ALBSU) was established by the Department of Education and Science and the Welsh Office on 1 April 1980 to act as a central focus for adult literacy and related basic skills work in England and Wales.

ALBSU has been established initially until March 1985 and administers a grant made by the Department of Education and Science and the Welsh Office for:

> **"developing within the general education service in England and Wales provision designed to improve the standards of proficiency for adults, whose first or second language is English, in the areas of literacy and numeracy, and those related basic communication and coping skills without which progress in and towards education, training or employment is impeded".**

As well as acting as a national focus, the Unit:

- operates a consultancy/advisory service to local education authorities, voluntary organisations and other bodies
- sponsors and, where appropriate, directly organises training, both regionally and nationally
- publishes books and other material
- sponsors a limited number of innovatory Special Development Projects.

As the national focus for adult literacy and related basic skills, ALBSU provides information on current provision for both individuals and organisations, publicises the basic educational needs of adults and liaises closely with other national bodies including government departments, employers organisations and trade unions.

ALBSU Publications

A full list of ALBSU publications is available from the Unit, however the following publications may be of particular interest to college staff who wish to look at literacy and numeracy teaching in more depth.

An Introduction to Literacy Teaching

(first published February 1980 by ALU. Second edition published May 1982 by ALBSU)

is the standard introduction to adult literacy teaching for teachers and tutors and offers some ideas on general approaches to teaching as well as specific suggestions for work at various levels.

52 pp.
ISBN 0 906509 16 5
Price: 60p
Postage and packing: single copies 22p; 5 copies 65p; 10 copies £1.30.

An Introduction to Numeracy Teaching

(published June 1982)

provides concise and clear guidance about teaching numeracy and while not intended to be comprehensive, provides a useful introduction for tutors and teachers.

64 pp.
ISBN 0 906509 19 X
Price: 60p
Postage and packing: single copies 22p; 5 copies 95p; 10 copies £1.60.

Literacy, Numeracy and the Young Trainee

(published March 1981)

was produced for supervisors on Youth Opportunities Schemes. It suggests ways of recognising trainees' literacy and numeracy needs and gives some advice on ways in which supervisors can help trainees in the normal course of a day's work.

32 pp.
ISBN 0 906509 04 1
Price: £1.00
Postage and packing: single copies 30p; 5 copies £1.30; 10 copies £1.60.

Available from

Adult Literacy & Basic Skills Unit,
Kingsbourne House,
229/231 High Holborn,
London WC1V 7DA.
Telephone: 01-405 4017.

£1.20
plus postage and packing

ISBN 0 906509 33 5

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